

Abstract

An electromotive machine having a stator element and a rotor element, the stator element including at least one set of N preferably toroidally shaped electromagnetic members, the electromagnetic members arranged along an arc a predetermined distance apart defining a stator arc length. Each of the members has a slot, and the rotor element includes a disc adapted to pass through the slots. The disc contains a plurality of permanent magnet members spaced side by side about a periphery thereof and arranged so as to have alternating north-south polarities. These permanent magnet members are sized and spaced such that within the stator arc length the ratio of stator members to permanent magnet members is N to $N+1$, where N is the number of electrical excitation phases applied to the electromagnets. The electromagnetic members are energized to create high torque and smooth operation.